

Clean Version of Pending Claims

METHOD FOR ALTERING THE NUTRITIONAL CONTENT OF PLANT SEED

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Serial No.: 09/602,840

72. A fertile transgenic *Zea mays* plant having an increased starch content, the genome of which is stably augmented by a preselected DNA sequence encoding an RNA molecule which is substantially identical, or complementary, to a mRNA encoding a plant seed storage protein, wherein the preselected DNA sequence is expressed in the cells of the transgenic plant in an amount sufficient to decrease the amount of said seed storage protein and to increase the starch content relative to the amount of said seed storage protein and starch content in the cells of a plant which only differ from the cells of said transgenic plant in that said preselected DNA sequence is absent, and wherein said preselected DNA sequence is transmitted through a complete normal sexual cycle of the transgenic plant to the next generation.
73. A fertile transgenic *Zea mays* plant, the seeds of which have an increased starch extractability, the genome of said plant which is stably augmented by a preselected DNA sequence encoding an RNA molecule which is substantially identical, or complementary, to a mRNA encoding a plant seed storage protein, wherein the preselected DNA sequence is expressed in the seeds of the transgenic plant in an amount sufficient to decrease the amount of said seed storage protein and to increase the starch extractability of the seed relative to the amount of said seed storage protein and starch extractability in the seeds of a plant which only differ from the seeds of said transgenic plant in that said preselected DNA sequence is absent, and wherein said preselected DNA sequence is transmitted through a complete normal sexual cycle of the transgenic plant to the next generation.
78. A seed derived from the plant of claim 72 or 73.

79. Progeny plant derived from the seed of claim 78.
84. The transgenic plant of claim 72 or 73, wherein the promoter comprises the 10 kD zein promoter.
86. The transgenic plant of claim 72 or 73, wherein the promoter comprises the 27 kD zein promoter.
88. The transgenic plant of claim 72 or 73, wherein the preselected DNA sequence, which encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding a seed storage protein, encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding 19 kD α -zein protein.
89. The transgenic plant of claim 72 or 73, wherein the preselected DNA sequence, which encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding a seed storage protein, encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding a 22 kD α -zein protein.
90. The transgenic plant of claim 72 or 73, wherein the preselected DNA sequence, which encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a seed storage protein, encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a 19 kD α -zein protein.
91. The transgenic plant of claim 72 or 73, wherein the preselected DNA sequence, which encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a seed storage protein, encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a 22 kD α -zein protein.

94. The transgenic plant of claim 72 or 73, further comprising stably transforming the cells with a gene which encodes kernel hardness.
95. The transgenic plant of claim 72 or 73, wherein the cell is transformed by a method selected from the group consisting of electroporation, microinjection, microprojectile bombardment, and liposomal encapsulation.
100. The transgenic plant of claim 78 or 79, further comprising stably transforming the cells with at least one selectable marker gene.
101. A method of producing a *Zea mays* seed with increased starch content, comprising:
 - (a) growing a transgenic *Zea mays* plant, the genome of which is augmented with a preselected DNA sequence encoding an RNA molecule which is substantially identical, or complimentary, to a mRNA encoding a seed storage protein, wherein the preselected DNA sequence is expressed in the cells of the *Zea mays* plant in an amount sufficient to decrease the amount of seed storage protein; and
 - (b) selecting a seed from the transgenic *Zea mays* plant, wherein the seed has an increased amount of starch relative to the amount of starch in a seed selected from a plant which does not comprise said preselected DNA sequence.

102. A method of obtaining starch from a *Zea mays* seed, comprising:
- (a) growing a transgenic *Zea mays* plant, the genome of which is augmented with a preselected DNA sequence encoding an RNA molecule which is substantially identical, or complimentary, to a mRNA encoding a seed storage protein, wherein the preselected DNA sequence is expressed in the cells of the *Zea mays* plant in an amount sufficient to decrease the amount of seed storage protein;
 - (b) obtaining seed from said plant; and
 - (c) extracting starch from the seed.
103. The method of claim 101 or 102 wherein the preselected DNA sequence is operably linked to a promoter functional in plant cells.
104. The method of claim 103 wherein the promoter comprises the 10 kD zein promoter.
105. The method of claim 103 wherein the promoter comprises the 27 kD zein promoter.
106. The method of claim 101 or 102 wherein the preselected DNA sequence encodes an RNA molecule which is substantially identical to all or a portion of the mRNA encoding a seed storage protein.
107. The method of claim 101 or 102 wherein the preselected DNA sequence encodes an RNA molecule which is substantially complementary to all or a portion of the mRNA encoding a seed storage protein.

108. The method of claim 106 wherein the preselected DNA sequence encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a 19 kD α -zein protein.
109. The method of claim 106 wherein the preselected DNA sequence encodes an RNA molecule substantially identical to all or a portion of a mRNA encoding a 22 kD α -zein protein.
110. The method of claim 107 wherein the preselected DNA sequence encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding a 19 kD α -zein protein.
111. The method of claim 107 wherein the preselected DNA sequence encodes an RNA molecule substantially complementary to all or a portion of a mRNA encoding a 22 kD α -zein protein.
112. The method of claim 101 or 102 wherein the genome of the transgenic *Zea mays* plant is further augmented with a DNA sequence encoding a polypeptide that provides the transgenic *Zea mays* plant with increased kernel hardness.
113. The method of claim 101 or 102 wherein the transgenic *Zea mays* plant is produced from cells transformed by a method selected from the group consisting of electroporation, microinjection, microprojectile bombardment, and liposomal encapsulation.
114. The method of claim 101 or 102 wherein the genome of the transgenic *Zea mays* plant is further augmented with at least one selectable marker gene.